ladders *a* and *j*, in which are laid iron-wire ropes from end to end, and these are drawn very tight, so as to strengthen the ladders and secure them from breaking.

Fig. 8 is a top view, and fig. 9 a side view, in section of a single ladder-escape: it is laid on the window-sill 1, and secured to the floor by the screw 2. At 3 are placed three studs: over and under these the rope 4 passes, then through a hole in the end bar 5; and ends in a slip-noose 6, to place round the body. By holding the other end lightly in his hand, a person may let himself down very easily; or he may let any other person down, and then pull it up to let himself down.

No. XIII.

A RAFT.

The Thanks of the Society were voted to Captain J. Cookesley, R.N. Rackley House, Portshead, near Bristol, for the following Communication respecting a Raft to be used in case of Shipwreck, or for other purposes.

Rackley House, Portshead, near Bristol,
June 16, 1834.

Sir,

The tempestuous weather we experienced during the last winter was attended with so much loss of life and property by shipwreck, that it must naturally excite the attention of naval men as to the best mode of saving lives on these emergencies. The great number lost and *so few*

saved, in so many instances, was a lamentable proof that the ordinary means resorted to on these occasions generally failed. Impressed with this consideration, I turned my mind to the construction of a raft, and recurred to a mode I formerly practised when in the command of H.M.S. Hazard: forming a raft on the deck for the blacking, &c. outside, to save the boats from dirty work, we soon got into the way of forming them with great facility; a quarter of an hour was time enough, and rafts of this description were hoisted into and out of the ship with the greatest ease. This practice led me to consider of the best method of constructing a raft, to save lives in cases of shipwreck; and I presented a model (similar to the one I here present to your Society) to Sir T. Hardy, then one of the Lords of the Admiralty: his opinion thereon I here insert, in a short note I received from him by return of post:—

"*Admiralty, February* 7, 1834.

"DEAR SIR,

"I HAVE been favoured with your letter of 6th instant, as well as a model of a raft for the preservation of life in the event of shipwreck. I think the plan very ingenious, and so simple, that it is quite within the power of the crew of any ship to prepare, according to their wants, as many rafts as are thought necessary," &c.

My object for presenting first to the Admiralty, was in the hope the crews of the men-of-war might be practised in preparing them with the real materials, and thereby make a lasting impression on their minds, that might avail them in the hour of peril, and bring it into use. With this view I now present the model to your very eminent Society, in the hope it may be made ge-

nerally known, particularly to the nautical community, so as may hereafter conduce to their preservation.

I have also a letter from Admiral Sir T. Williams, Commander-in-Chief, Portsmouth, stating "that all the officers of the navy, who had seen the model I sent him, concurred in expressing their conviction of the usefulness of a raft so constructed in cases of shipwreck." I send herewith instructions for preparing the raft, and beg to refer you thereto for further details. In respect to preparing a boat with empty casks, to save her from sinking, allow me to suggest, as I presume you have models of boats in your exhibition-room. One of these boats, prepared with small casks in the manner I have proposed, would be a good representation thereof; or if my services can in anywise promote these designs, I shall be happy to wait on the Society if they wish it, as I confess I feel much interested in promoting what I consider to be the cause of humanity. The observations I have made in the instructions for the inspection, particularly of naval men, I beg to recommend to their perusal, as a prospectus, without which its qualities may escape notice; and though many very ingenious inventions have been presented of late years, for saving of individual lives, yet I know not of any plan proposed that will at once afford refuge to an entire crew; the more especially when a vessel is foundering at sea, or on a lee-shore, floating over shallows and banks, where boats dare not venture; it must be obvious to all sea-faring men the resources are placed within their means; that casks, spars, and ropes are materials generally at hand in all vessels — rockets or mortars *are not*.

Should the Society approve of the plan here submitted, any intimation you will please to favour me with

respecting the mode they may adopt to propagate them, and to encourage their practice at this present or any future time, I shall be much obliged, as it will be a guidance to my proceedings in aiding to promote their intentions to the best of my power.

I beg further to observe, that a raft is the mariner's last and only resource when his boats fail him, when they are totally unequal to contend against an overwhelming sea; and the necessity of adopting some general plan of constructing them on a secure principle, may be instanced in the many failures of rafts during the continuous gales of the last winter.

The Water Witch steam-packet got ashore in the Bristol Channel, with a number of passengers on board; their boats sunk, people drowned; they had recourse to rafts; they were the whole of the night employed forming, I think, three rafts; only one reached the shore; the others capsized, and but a few saved on the raft that reached the shore. Lieutenant Chapman, R.N. at that time commanding the Victory steam-packet, who had seen my model, assured me he was confident, had he been placed in the situation of the Water Witch, or even near him at the time, to have veered a raft of my construction to her, they might have been all saved. He told me he should apply to the Steam-Packet Company to supply all their vessels with casks, that might answer the purpose whenever they were called. Of course, these casks were to be used for ordinary purposes until wanted.

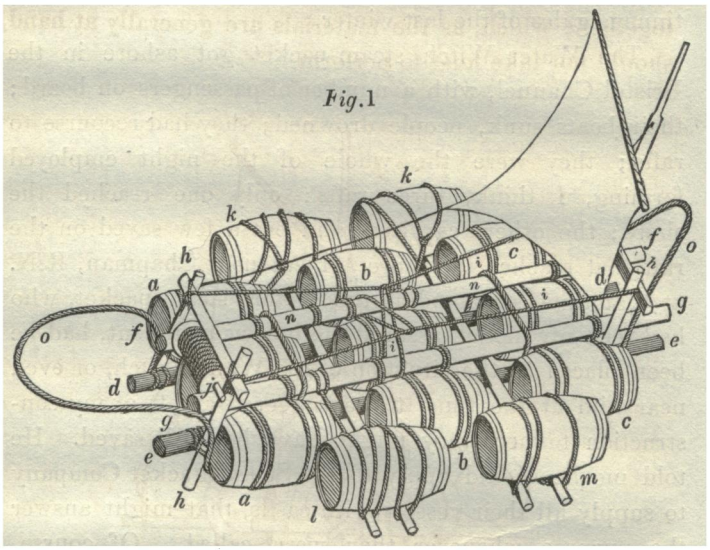
I am, Sir, &c. &c.

A. AIKIN, Esq.
Secretary, &c. &c.

JNO. COOKESLEY,
Captain R.N.

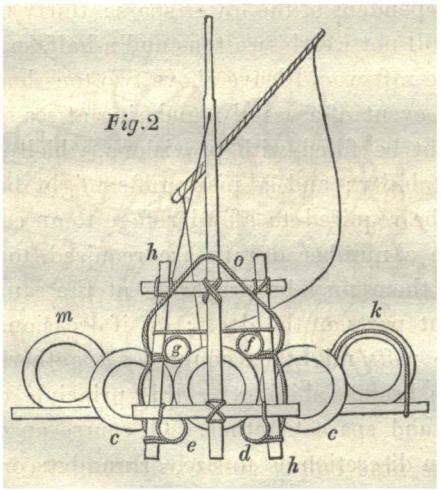
Description of a Model of a Raft for preserving Lives in the event of Shipwreck, by Capt. Cookesley, R.N.

This raft represents empty half-butts, or half-tuns; and this mode of securing them, by lashing spars, prevents the least play in any one of the casks, and, consequently, they are all brought to bear equally the weight with which they might be laden. There is no carpenter's work in the formation of this raft; it should be prepared on the part of the deck most convenient for hauling out by the yard tackles after it is finished.



Place nine empty casks in three sets, as *a a*, *b b*, *c c*, fig. 1: let a few men be appointed to prepare each set separately, by passing wouldings, or band-lashings, over, and embracing the ends of all the three casks; each set being thus prepared about the same time: then pass two spars, *d* and *e*, along the deck, and underneath the band-

lashings: these spars should be stout, as they bear the weight of the raft in hoisting out. Then place other two spars, *f* and *g*, over them. A rope then passed as a lanyard from the upper and round the lower spars, and hove taut with a Spanish windlass, formed with a spar of sufficient length to cross the raft, and set up both the lanyards together, will compress the spars so tightly down on the band-lashings as effectually to prevent the slightest play in any of the casks, and bind the whole firmly together. As the operation will be going on at the three sets at the same time, they may all be finished together; which, as the materials are generally at hand, should not take long to perform.



Securing the staunchions *h h*, kedge-ropes *i i*, &c. will be understood by seamen, very few of the lashings being here shewn. The sail represents a boat's mizen; the reel *j* a deep-sea lead-reel, intended to take a line ashore

from a ship on a lee-shore. By making the end of the lead-line fast to the ship before you leave, you have the line then to haul off again, or to draw a larger rope to the shore, after having landed a party of men. I have here confined my observations to the nine centre casks; the four wing-casks *h k*, *b*, and *m*, may be added or not at discretion, and according to circumstances. An oar is used to steer with: *n o*, *n o*, the slings. Fig. 2 is a front elevation.

The majority of the people should be placed in the spaces between the ends of the casks, though the kedge-ropes *i i* are intended for those who may be placed on the top of the casks. Nine half-butts (being casks commonly used in the navy) will displace four tons and a-half of water, independent of the lower spars: thirty men, on an average, will not weigh two tons and a-half, so that thirty men on the raft would leave above two tons buoyancy.

In the event of a vessel foundering at sea, the middle casks might be filled with provisions, which would give the raft stability; and as many rafts might be prepared as might be required to afford refuge to an entire crew: and where a number of rafts are required, to save time several of them may be preparing at the same moment on different parts of the deck; or, if occasion should require, two rafts might be connected together with cross spars, like beams, abiding by this principle of securing the casks and spars together. Of course an officer will use his own discretion as to size, or number, or necessary ballast.

The wing-cask *m* is secured by a slip-rope. The intention of this is to shew a proposed plan of taking a ship's bower-anchor out, and letting it go, as ships' boats are not equal to this operation. In cases of emergency, I

would place a bower-anchor on the centre of the raft; and two of the wing-casks on one side; being thus prepared with slip-ropes, and the raft having been towed or hauled out to the required position, send boats to the opposite side to let go the slip-ropes: the casks fly off from the raft, and, for want of support on that side, the raft capsizes, and the anchor goes to the bottom. The boats, of course, should be prepared to pull a stroke from the raft the moment they let go the slip-rope.

The object of getting a rope on a lee-shore from the ship may be attained without the aid of rockets or mortars, with a raft of four casks, formed on the same principle of securing them, making use of two spars only, and placing the casks two abreast at proper distance, with a small sail or board at the extreme end. Form a rail at the other end by shipping two handspikes through the bungholes, and through holes at the bottom, clenched with a spike-nail to prevent their working out. Fasten a cross-piece from one handspike to the other, on which hang a deep-sea lead-reel and line: fasten the end of the line to the ship. The lead-line will tend to check the raft from yawing, keeping her before the wind till she reaches the shore, supposing there is not a man on the raft to steer. The materials here used are common to all vessels. For my own part, rather than trust myself (according to a plan lately proposed, through the precarious instrumentality of rockets) to be placed in an accommodation-chair, hauled on shore at the risk of my life, and half drowned when I got there, I should prefer running a handspike through a cask, as described in the small raft, securing a deep-sea lead, or small pig of ballast, to the square end, the small end pointing up through the bung-hole like a small mast to hold on by: the weight

at the bottom prevents the rotary motion of the cask. There is nothing new in this: the principle has been applied to life-buoys, and answered well. The person strides the cask, and holds on by the handspike.

I beg further to draw your notice to a ready method of securing a boat against sinking, though a sea may fill her to the gunwale. Boats are generally, in all vessels, prepared with gang-casks for watering. Suppose the nine centre casks in the raft were a set of gang-casks in a boat, with band-lashings passed over their ends, as in the raft: take a couple of spars, place them over the lashings, as in the raft; then lash the fore-ends taut down to the forethwart, and after-ends to the afterthwart, these thwarts being always fixtures. This will press the casks so tightly down on the bottom boards as to secure them effectually. Supposing these casks to be half-butts, they would displace four tons and a-half of water, and render the boat so much lighter when she is filled to the gunwale. In cases of emergency, any boat may be prepared in this manner at a very short notice.

In comparing this raft with others, I beg leave to remark I have not seen any models calculated to carry an entire crew of a ship. They are prepared only to take a few men, their construction generally forming a kind of frame or scaffolding on a deck, which at these times the best *sea legs* can hardly stand upon: or what crew would prepare such a raft to save the *favoured few*, when their own lives are in such jeopardy? Neither can any sail be set on these rafts, nor under the guidance of a rudder or oar to steer with, or a rope to haul them back again to the ship, which in my raft is provided for by the deep-sea lead-reel.

It appears to be the object of the different societies

formed for the preservation of lives, to render every aid in their power from the *shore* to vessels in distress. I am for rendering seamen more dependent on their own resources, and place the means within their power. The principle of preparing a boat with casks to keep her from sinking is adopted by Captain Manby; and his plans are excellent. The difference between mine and his is this: his boats must be prepared in a certain way to secure the casks, and the casks must also be fitted to the boat. My plan requires no preparation of the boat whatever, and is rendered as secure as Capt. Manby's in a few minutes. In the event of a ship foundering or taking fire at sea, boats thus prepared would be of the greatest service. On those occasions, the spaces between the heads of the casks in the raft should be filled up with ships' companies' hammocks, or sails made up (dunnage of some sort), as a protection to the heads of the casks, and to form a platform over all: the centre casks being filled with provisions would give sufficient stability to the raft.